

## **WHAT IS CLAIMED IS:**

1. A transformer formed from a multi-layer PCB comprising:
  - a plurality of conductive traces having a curved shape and two terminal ends, each conductive trace formed on an insulating layer of said PCB and positioned such that said conductive traces form a stack; each said insulating layer defining an aperture, wherein each said conductive trace is shaped to substantially surround the perimeter of a respective one of said apertures;
  - a plurality of conductors for interconnecting the terminal ends of each said conductive trace to form at least one turn of a first winding and one turn of a second winding;
  - a first conductive layer attached to an outer surface of said PCB in a position at the top of said stack and having two terminal ends and approximately the same shape as said conductive traces, such that said conductive layer defines an aperture that corresponds to the shape of the apertures formed in said insulating layers;
  - a core positioned in the space defined by said apertures; and
  - an additional conductor for connecting at least one of said conductive layer terminal ends to a terminal end of at least one of said conductive traces, such that two windings are formed by said conductive traces and said conductive layer.
2. The transformer of Claim 1, wherein one of said conductive traces is formed on the top surface of said PCB and wherein said first conductive layer is in conductive contact with said top conductive trace.
3. The transformer of Claim 2, wherein said conductive contact includes the soldered attachment of said top trace to said first conductive layer.
4. The transformer of Claim 1, wherein said first conductive layer is a metal foil.
5. The transformer of Claim 1, wherein each said insulating layer defines an aperture, wherein each said conductive trace is in the shape of a loop positioned adjacent to the perimeter of a respective one of said apertures, and wherein said first conductive layer is shaped to define

an aperture that corresponds to the shape of the apertures formed in said insulating layers, said transformer further comprising a core positioned in the space defined by said apertures.

6. The transformer of Claim 1, further comprising a second conductive layer attached to an outer surface of said PCB in a position at the bottom of said stack and having two terminal ends and approximately the same shape as said conductive traces, such that said second conductive layer defines an aperture that corresponds to the shape of the apertures formed in said insulating layers, and wherein said first conductive layer is connected in parallel with a first one of said conductive traces and said second conductive layer is connected in parallel with a second one of said conductive traces.

7. The transformer of Claim 1, wherein at least one of said conductive traces is connected by said conductors to form a first turn of said first winding, and wherein at least one of said conductive traces is connected by said conductors to form a second turn of said first winding.

8. The transformer of Claim 7, wherein at least one of said conductive traces is connected by said conductors to form a first turn of said second winding, and wherein at least one of said conductive traces is connected by said conductors to form a second turn of said second winding.

9. The transformer of Claim 1, wherein a first plurality of said conductive traces is connected by said conductors to form one turn of said first winding and a second plurality of said conductive traces is connected by said conductors to form one turn of said second winding.

10. The transformer of Claim 9, wherein said first conductive layer is connected as one of the turns of said second winding.

11. The transformer of Claim 1, wherein one of said conductive traces is formed on the top surface of said PCB, said electromagnetic component further comprising an insulator disposed between said top conductive trace and said first conductive layer.

12. The transformer of Claim 11, wherein each said insulating layer defines an aperture, wherein each said conductive trace is shaped to substantially surround the perimeter of a respective one of said apertures, and wherein said conductive layer and said insulator define an aperture that corresponds to the shape of the apertures formed in said insulating layers, said component further comprising a core positioned in the space defined by said apertures.

13. The transformer of Claim 11, wherein said first conductive layer forms a first turn of said first winding, and wherein a plurality of conductive traces are connected by said conductors to form a second turn of said first winding.

14. The transformer of Claim 1 wherein said plurality of conductors comprise at least one plated through hole formed in each said insulating layer.

15. A transformer formed from a multi-layer PCB comprising:  
a plurality of conductive traces having a curved shape and two terminal ends, each conductive trace formed on an insulating layer of said PCB and positioned such that said conductive traces form a stack, and wherein one of said conductive traces is formed on the top surface of said PCB;

a plurality of conductors for interconnecting the terminal ends of each said conductive trace to form two windings, each winding having at least one turn; and

a conductive layer conductively attached to said top conductive trace.

16. A transformer formed from a multi-layer PCB comprising:  
a plurality of conductive traces having a curved shape and two terminal ends, each conductive trace formed on an insulating layer of said PCB and positioned such that said conductive traces form a stack, and wherein a first one of said conductive traces is formed on the top surface of said PCB and a second one of said conductive traces is formed on the bottom surface of said PCB;

a plurality of conductors for interconnecting the terminal ends of each said conductive trace to form two windings, each winding having at least one turn;

a first conductive layer conductively attached to said top conductive trace; and

a second conductive layer conductively attached to the bottom conductive trace.

17. A transformer formed from a multi-layer PCB comprising:

a plurality of conductive traces having a curved shape and two terminal ends, each conductive trace formed on an insulating layer of said PCB and positioned such that said conductive traces form a stack; each said insulating layer defining an aperture, wherein each said conductive trace is shaped to substantially surround the perimeter of a respective one of said apertures;

a plurality of conductors for interconnecting the terminal ends of each said conductive trace to form at least one turn of a first winding and one turn of a second winding;

a first conductive layer attached to a first outer surface of said PCB in a position at the top of said stack and having two terminal ends and approximately the same shape as said conductive traces, such that said first conductive layer defines an aperture that corresponds to the shape of the apertures formed in said insulating layers;

a first additional conductor for connecting at least one of said first conductive layer terminal ends to a terminal end of at least one of said conductive traces

a second conductive layer attached to a second outer surface of said PCB in a position at the bottom of said stack and having two terminal ends and approximately the same shape as said conductive traces, such that said second conductive layer defines an aperture that corresponds to the shape of the apertures formed in said insulating layers;

a second additional conductor for connecting at least one of said second conductive layer terminal ends to a terminal end of at least one of said conductive traces; and

a core positioned in the space defined by said apertures, such that two windings are formed by said conductive traces and said conductive layers.